

TRANSMISSION CONSTRAINTS ON GENERATION SITING WORKSHOP SUMMARY

INTRODUCTION

On March 15, 2001, the California Energy Commission (Energy Commission) conducted the Transmission Line Issues Workshop to discuss requirements for conducting transmission line interconnection studies and transmission line constraints that may affect the licensing of future powerplants by the Energy Commission. A volunteer panel, comprised of transmission industry representatives discussed transmission line issues associated with powerplant licensing, information needed to develop appropriate actions to address constraints, and methods to avoid or lessen transmission line congestion related to the licensing of future powerplants.

OVERVIEW OF ORAL PRESENTATION

Mr. Jim McCluskey, representing the Energy Commission staff, provided a brief overview of the staff's workshop paper. The paper addressed two areas where transmission issues potentially could affect generation siting. One area is the Participating Transmission Owner (PTO) and California Independent System Operator – (CAISO) interconnection process. The second is the effects transmission line congestion may have on facility siting, especially where it may limit market access opportunities for new generators.

The interconnection process involves a number of participants and procedures. The process begins when an applicant submits an interconnection request to the connecting PTO and to the CAISO. The PTO may perform two studies, a system impact study and a detailed facility study. The impact study is used to identify potential reliability problems that would occur in the transmission system when a new generator connects to the grid. If reliability problems are identified in the studies, the applicant may request that the PTO perform a detailed study to determine what measures should be implemented to mitigate those impacts and to identify their associated costs.

Reliability impacts may be caused when new generators connect to the grid and create system conditions that violate accepted reliability criteria. These would include thermal, stability and voltage criteria violations. Some reliability criteria violations may be mitigated through remedial action schemes (RAS), such as measures that would curtail generation output during emergency conditions. Others may require transmission line expansion or replacement, or addition of transformers, circuit breakers or other system components. Current policies require that the connecting generator pay the costs of the interconnection studies and the costs of mitigating reliability problems.

The second area concerns congestion-related issues that could affect siting of new generation facilities. Congestion refers to increased loading on transmission lines and equipment. But unlike reliability problems, the grid operator is able to dispatch generation to reduce congestion so that the system can still serve load without violating reliability standards. Increased congestion usually causes higher transmission delivery

costs. The addition of new generation resources to the grid may create new or aggravate existing congestion problems, with multiple effects. At some point it becomes necessary to identify longer term, more costly solutions to congestion problems, such as transmission expansions. The issue of who should pay to mitigate congestion problems has been a long-standing and contentious issue. In the past the CAISO adopted the position that the market should pay for such expansions based on the costs of congestion versus the costs of grid expansion. Others believe that new generators that cause or increase congestion when they connect to the grid should pay. To date a market approach to encourage transmission expansions has not worked for a variety of reasons and the Federal Energy Regulatory Commission (FERC) has rejected the view that new generation should pay transmission expansion costs.

PANEL. 1: TRANSMISSION LINE INTERCONNECTION

Mr. Jeff Miller, CAISO

Mr. Jeff Miller explained the CAISO's role in reviewing and commenting on interconnection studies, as well as the queuing process for generators. He also provided a brief overview on the number of generating projects the CAISO is reviewing and how they're distributed, as well as an overview of some of the major transmission projects the CAISO is considering.

The CAISO process is governed by the CAISO Tariff that has been filed at FERC. It is also governed by the tariffs transmission owners have filed with FERC, as well as the transmission control agreements that provide the CAISO with certain rights in the transmission owner system. The CAISO has a four-step process that is identified in that tariff. The first step is the interconnection request. The second is the performance of a system impact study (SIS). The SIS, performed by the PTO, is done to determine the impact of interconnection on their system, and to determine whether upgrades will be required. The scope for this study is generally agreed upon among the CAISO, the PTOs and the generation developer, before it is started. The model used to perform many of these studies incorporates the major transmission and generation facilities located in the western interconnected grid, west of the Rocky Mountains. The parties' use their collective understanding of the system to determine how severe they expect the impacts to be, and what should be covered in the study. The third step is the detailed facility study (DFS), which is used to determine exactly what measures should be deployed to mitigate impacts caused by the new facility, along with their costs. The fourth step is to coordinate with the rest of the Western Systems Coordinating Council (WSCC), and the Regional Transmission Groups.

While the WSCC has the ability to object to what is being proposed, the WSCC process is designed to deal more with major changes to bulk transmission facilities, like the interconnections between the Northwest and California, than with generation interconnection impacts. The major work effort is directed at the system impact study and the facility study that are carried out by the transmission owners with CAISO review.

The CAISO's present philosophy is not to require the generation developer to mitigate impacts on the major portions of the interconnected system but to require the developer

to construct facilities to allow it to interconnect with the system. The CAISO also requires them to perform upgrades if there is a defined reliability problem associated with a new generation project.

The CAISO has developed a process involving a number of different approvals depending on the type of project. The one used most often with the Energy Commission is called a preliminary approval. Preliminary approval means that the CAISO is satisfied that the generation project owner has identified all the major facilities that will be required to connect their project into the grid. There may still be some outstanding interconnection issues, however, the Energy Commission can use the preliminary approval as the basis to determine what, if any, major new transmission facilities will be required to connect the generation project to the grid, and thus, what environmental impacts may occur. The CAISO has developed the preliminary approval process mainly to facilitate the siting process. The CAISO has also developed a conditional approval. This covers cases where the CAISO is unsure that all the impacts have been addressed, but it does not have all the documentation that it may need on the project from the transmission owner. With the presumption that the necessary documentation can be provided within a certain period, the CAISO provides a conditional approval, with final approval required prior to complete interconnection.

Given the current shortage in electricity supplies, the CAISO has recognized that transmission owners are required to complete studies in a short time frame, in some cases, in seven days. Therefore, the CAISO has shortened its process to a few days. As soon as the CAISO receives a notification from the generation developer, it initiates internal review. Within 24 hours the CAISO's planning engineers start the analysis. The CAISO attempts to provide a recommendation, for smaller projects, within two days of receiving the study. Larger and more complex projects could take longer. Mr. Al McCuen, representing the Energy Commission staff, noted that interconnection studies have never held up the Energy Commission licensing process. He noted that although it's been very difficult, the CAISO has been able to complete its reviews in a timely manner. It is quite common that the Energy Commission staff see a preliminary approval in as short as three days.

MR. David Korinek, SDG&E

Mr. David Korinek focused his comments on study resources, study process, study timeframe and queuing. He noted that the human resources available to conduct studies are a very limited commodity. In the entire state, including the PTOs and the CAISO, and qualified consultants, the people that are capable of performing these types of studies are numbered in the few dozen.

Mr. Korinek presented data that identified the number of studies his organization has been requested to perform. In 1998 and 1999 they had one or two sites each year to study. In 2000 they had over 30 sites to study. Based on requests this year to date, it looks like they will again be requested to perform about 30 studies. Notwithstanding the Governor's directive to expedite the studies for simple cycle and combined cycle units in 2001 and 2002, the average time required to do this type of study is still on the order of one to three months.

Mr. Korinek suggested that an applicant apply as early as possible. The earlier applicants enter the queue the better position they will be in to have their studies expedited through the process. He also requested applicants to keep in mind that there are others in front of them in the queue. Applicants need to understand the number of other applicants and their competing business plans and timetables. He also noted that competing applicants need to be given the same care and thorough analysis for their requests that they would, themselves, like to have.

Another option is the consideration of joint studies between applicants. In those cases where there are more than one applicant project connecting at a location in the system, or similar locations in the system, and on a similar timeframe, there may be an opportunity for those applicants to participate in a joint system impact study. This process would require applicants to make more disclosure of their business plans than, in some cases they're willing to do currently. Mr. Korinek encouraged applicants, where possible, to consider working with the PTO to determine if there are other applications that can be studied as a joint study. He also encouraged merchants to try to expedite the design and engineering of the facilities before the studies are done. In addition to study resources being limited, engineering, design and construction resources are also very limited. Mr. Kroinek noted that SDG&E supports the centralized queuing process by the ISO.

James Leigh-Kendall, SMUD

Mr. James Leigh-Kendall first discussed the issue of transmission studies. He believes studies need to be done and that they can be completed in a timely manner. SMUD's process is similar to the ISO's process. SMUD believes that common rules and processes are required to meet the timelines for building and interconnecting a generation project. Mr. Leigh-Kendall also discussed the constraints and upgrades that are identified through the studies. His main concern was that any new rules for a new project interconnection should add to, not diminish, the capability of the existing system to serve load. He sees a relationship between congestion and reliability.

Mr. Leigh-Kendall noted that under the old rule, new connections were made after other parties made system reinforcements. Since it was not necessary for all entities to pay for system upgrades when interconnections were made, a fairness question arose. Some parties could interconnect without paying, because there was an existing margin of capacity on the system. He noted that it's unfair to have the last project that causes a reliability problem to pay for massive upgrades that may be required by its interconnection.

He also noted that remedial action schemes (RAS) have increasingly become an easy solution to grid problems caused by an interconnection. SMUD has concerns regarding the potential consequences of not properly operating or coordinating the use of RAS. He also noted that the recent increase in the use of RAS tends to effect the more efficient units since these tend to be the more recent facilities deploying RAS to mitigate criteria violations caused by their interconnection. SMUD believes that constraints should be solved by upgrades, either transmission or generation, located close to load, rather than curtailment of generation through complex protocols such as RAS. The basic premise here is that adequacy and reliability should be looked at together.

Mr. Leigh-Kendall provided two recommendations. First he pointed out that all policies and interconnection procedures should preserve capabilities to serve load growth; this approach would utilize transmission upgrades or generation located close to load to mitigate reliability problems rather than using RAS. SMUDs second recommendation was that new generators should share the costs of mitigating reliability problems caused by interconnection, rather than having the burden fall on a single entity. He recognizes that this is a complicated issue and does not have a solution at this time but believes it is an approach that should be studied.

Mr. Morteza Sabet, WAPA

Mr. Morteza Sabet provided a brief overview of Western Area Power Administration (Western or WAPA) and its transmission and marketing functions. Although Western is a wholesale utility with no load growth obligation, load growth has resulted in additional use of its transmission system, thereby depleting its capacity margins.

Western has participated in the Sacramento Transmission Planning Group that conducted much discussion about the RAS philosophy versus downstream transmission expansions. Mr. Sabet believes it is necessary to look at each project in that project's setting. Therefore, public policies need to be flexible enough to allow the best results for the public investment.

The majority of Mr. Sabet's remarks were directed at the system in and around the Sacramento area. He believes that the area transmission capacity is not adequate to import the amount of power needed in the area in the long run; this will and is resulting in short term mitigation strategies, i.e., voltage support and remedial action. He noted that the Sutter Power Plant was allowed to be interconnected, since the area was better off with it than without it, even if its output may be curtailed by RAS during some emergency conditions.

Mr. Sabet appealed for parties to look at the public good aspect of what is being done, and give the transmission owners the ability to do the things that are necessary to solve problems. He stated that he did not think that asking the generator-developer to pay for the downstream infrastructure is going to work.

Manho Yeung, PG&E

Mr. Manho Yeung first discussed Pacific Gas and Electric's (PG&E) past and present workload for conducting interconnection studies. Over the past 14 months PG&E has completed about 35 generation interconnection studies, with considerably more activity during the past few months. For projects ranging from 100 to 1000 megawatt, the time it takes to complete these analyses has averaged approximately 145 days. They are able to complete studies for projects under 100 megawatts within 50 days. He reported that system impact studies typically takes about 60 days with facility studies taking an additional 90 days. PG&E also provides an expedited study that basically combines both the SIS and DFS studies that takes roughly 90 to 120 days.

In addition to the above studies, PG&E has also provided study support for the CAISO's summer 2001 Request for Bids effort for signing up peaking generation to be available

for the summer of 2001. These studies generally, take three to four weeks to complete. PG&E is also in the process of developing a framework to implement the Governor's executive order that requires some interconnection studies to be completed in seven days. PG&E is focusing its study efforts on a more localized area, rather than looking at the broader system for this work. This is done through the use of engineering judgment and the knowledge of local areas. Generation proposals for these types of projects typically are of a smaller size, 50 megawatt or less and generally do not require the same level of detailed analysis that is required for the larger projects. PG&E has completed about ten of these projects, averaging 21 days.

PUBLIC COMMENT

Mr. Jack Pigott, Calpine

Mr. Jack Pigott pointed out that negotiating an interconnection agreement involves more than performing an engineering study. Since it is really a business negotiation it is difficult to place a time line on it. To the extent that the cost allocations can be determined ahead of time, a lot of the issues are removed from the business negotiation and it becomes a much faster process. He also pointed out that queuing is a major issue that creates cost responsibility problems and the potential for litigation that can slow down the interconnection process.

Mr. Pigott indicated that Calpine does not believe that the individual generators should be responsible for the bulk of transmission upgrade costs; he realizes, however, that this has to be within reason. He noted that there are sites that just don't make sense from a transmission standpoint, but thinks that most generators try to pick sites that are close to load where it makes the most sense to locate.

PANEL 2: TRANSMISSION CONGESTION AND ACCESS TO MARKETS

Mr. Jeff Miller, CAISO

Mr. Jeff Miller began by noting that congestion is not all bad, and does have some positive aspects. For one thing, the CAISO tries to use congestion to signal generators to locate at sites where it would be most advantageous from the CAISO's perspective for grid management. Typically it wants new generators siting close to load, and it tries to use its congestion management process and transmission losses to indicate these locations. Locating close to load can reduce the costs of both transmission congestion and losses for generators; locating at sites remote from load centers can increase those costs. However, locating close to load raises air quality, water, and public opposition issues. Consequently, there are advantages and disadvantages siting projects near load centers as compared to remote locations. Mr. Miller stated that aside from reduced line losses and congestion there may not be a great advantage to generators to locate near load. While there are some incentives the CAISO can use to influence locational decisions for new generators, there is no automatic process.

The CAISO plans to submit a new generator interconnection policy and long term grid planning procedures to FERC in the near future; those procedures should provide some locational incentives for new generation. The new facilities interconnection process will

include a policy regarding whether new generators will have to mitigate incremental congestion they cause. The proposed grid planning process will include a competitive solicitation process through which transmission proposals could be weighed against generation and load management alternatives that could accomplish the same objectives as transmission, but at lower costs and with fewer environmental impacts.

Mr. Miller stated that the CAISO would welcome an expanded planning role by the CEC. He also said that many generation applicants are proposing siting facilities in areas that are remote from load centers such as the California-Arizona border. He said the CAISO is thinking about developing a 500 kV transmission line to bring this generation from this area to load centers in California. He also said that the CAISO's congestion management procedures are not working well as they allow for gaming by market participants. The CAISO is currently working on a comprehensive market reform policy to address these problems. One of the elements of the policy is a revised congestion management procedure that will provide more effective congestion pricing signals to indicate optimal locations for siting new generation.

Mr. Eddie Lim, SMUD

Mr. Eddie Lim's presentation focused on two areas. First, he wanted to provide the Committee with an understanding of remedial action schemes (RAS) and their application and potential problems. Second, he discussed SMUD's concept of energy parks. Mr. Lim said that SMUD is concerned about the potential overuse of RAS. He said that RAS are similar in some ways to highway metering and control systems that try to control congestion and the flow of traffic. Both have manual and automatic mechanisms for controlling flow problems. Whereas traffic mechanisms control the flow of traffic, RAS are used to reduce power plant output to prevent transmission lines from over loading and causing reliability problems. SMUD believes that RAS have limited application as short-term measures to address potential reliability problems, however, they should not be used as substitutes for transmission expansions to mitigate those problems in the long term. The increased use of RAS SMUD is seeing is because of their relatively low costs, when compared to transmission expansion.

Mr. Lim then moved to a planning perspective. He noted that urban development requires planners to design and create zones for different types of development - residential, industrial, commercial, wetlands, etc., but that we don't plan areas for energy zones. He suggested that energy zones could be planned in a similar way to other areas. He envisioned energy zones as land tracts where certain necessary services for operating powerplants such as water, natural gas, electric transmission facilities and sewer systems are in place and potentially ready for use by power plant developers. The Rancho Seco Site is an example of a potential energy park. It is close to a load center, has available water, transmission, zoning for power plant development, and room for about 2000 mw of generation. However, it lacks gas facilities. Mr. Lim knows there are many transmission studies underway now and that as part of this study process potential energy zones could be identified where we could add generation and minimize the need for transmission additions and the use of remedial action schemes.

Mr. Morteza Sabet, WAPA

Mr. Morteza Sabet began by saying that he has been pleasantly surprised that power plant developers are doing a good job of identifying good sites to locate their facilities. They are looking for sites with water, sewer, and gas and also conducting power flow analysis to identify the best sites to locate.

Mr. Sabet next said that he is fairly comfortable with the use of RAS schemes, at least as they have been applied in the Sacramento area. He believes the area is better off with the use of RAS (at the Sutter power plant location) than without it; and though a transmission expansion would have been a better solution for dealing with the problem, no one would finance and build it. He does not believe RAS schemes are sustainable over the long term in the Sacramento area, however, because the transmission system is reaching its limit. He believes there are overall problems with the use of RAS as they depend, to some extent, on human decisions and different operators may have different opinions as to how to address problems; this is why there are automatic backup systems. He said that in a rural area, at the end of a transmission line, RAS applications may be quite acceptable because they may not have impacts on the system if generation is curtailed.

Regarding transmission planning to bring power to the Sacramento area, Mr. Sabet said that WAPA is conducting initial transmission planning studies and examining several corridors in which to build 230-500 kV transmission lines to bring power to the area in case new generation isn't sited locally. He said there is uncertainty associated with building additional transmission as planners don't know where or if new generation is going to be developed in the region. One reason for this is there are survival problems with applicants seeking to site new generation in the state. He said that if generation is planned then WAPA can build transmission to that point, but planning transmission in cases of uncertainty is difficult. There are also problems with transmission planning in the state, especially with the CAISO/PTO planning process. He said that when planning new transmission facilities WAPA is able to identify corridors, obtain financing, and conduct environmental studies in advance. With the CAISO/PTO grid planning process, however, no one is responsible for initiating economic projects to eliminate congestion or provide market access and guide these projects through the planning and developmental stages, except on a voluntary basis. He believes that market forces are not working in these situations to stimulate investment in economic transmission expansions.

Ms. Nancy Werdel, WAPA.

Ms Nancy Werdel discussed issues concerning voltage support in the Sacramento area and environmental constraints associated with building transmission lines. WAPA started an environmental impact statement (EIS) for voltage support projects in the Sacramento area a year ago. Enhanced voltage support could be accomplished via several types of alternatives including transmission upgrades, new transmission lines, local generation, and demand side management. The EIS will be used for evaluating both short-term (next 5 years) and long-term solutions. It will also provide the foundation for longer-term projects such as a potential 500k-kV line into the area. The federal EIS is approximately a 2 year study. Mr. Sabet pointed out that they had examined both 230 kV and 500 kV lines for local area voltage support. The problem

with 230 kV lines is that by the time they are completed the area will need additional transmission. He said that they haven't yet obtained project sponsorship or funding to build the lines but they know where the feasible corridors are and they have a general buy-in from customers and generators. Mr. Lim from SMUD said they have also been studying the voltage problem in the area for the past two years and would like to consider locating generation close to load at a Rancho Seco "energy park" as a possible solution to the problem. This might make the area an electricity exporter, rather than continuing to rely on imports. He suggests this could be an alternative to running 500 kV lines to the area. He would like to consider bringing this before the Commission as an option. Mr. Sabet agreed with this proposal.

Ms. Werdel spoke next about environmental constraints to building transmission lines. One problem is that it is difficult to significantly expand transmission right of ways or find new ones. Public opposition to new lines is increasing and the longer we wait the more constraints will develop. Commissioner Laurie asked about the extent to which upgrades can be made within existing rights of way. Mr. Sabet said that in the past utilities used to conduct long term transmission planning and buy rights of way in anticipation of future need; this has greatly diminished. Ms Werdel said that urban sprawl is limiting where new transmission lines can be located or existing capacity upgraded. Mr. Yeung said that PG&E does not have adequate transmission rights of way for system expansions over the next 20-25 years. Also, in the past utility land acquisition often occurred in bits and pieces. Commissioner Pernell asked if anyone is doing, or has done 20 year planning. Mr. Sabet said a comprehensive study was done in the mid 1990s and he will provide a citation. Ms. Werdel said that WSCC's environmental work group may be doing this kind of planning. Mr. Miller thinks there is a gap in grid planning at this time. Deregulation shorted the planning horizon from 10 years to 5 years, which has created problems because it takes as long as 6 years to permit some transmission projects. He said the CAISO plans to use a 10 year planning horizon. No one, however, is in the lead attempting to identify transmission corridors.

Mr. Jim Philippe, PG&E Corp

Mr. Jim Philippe discussed both interconnection and congestion issues and solutions during his presentation. He said that interconnection disputes between PTO's and developers are barriers to new generation siting. Currently, interconnection policies differ from PTO to PTO and developers must accommodate those differences. Differences occur now because each PTO has a different interpretation of the tariffs. A solution to this problem is for the CAISO to adopt a single, uniform interconnection policy that applies to all PTO's. It would also be helpful if the CAISO resolved interconnection disputes between PTO's and applicants. Currently the applicant and PTO try to resolve disputes between themselves. They can also go to FERC for resolution but that can be a long process.

Mr. Philippe said that new generators should be responsible for correcting reliability problems they cause when they connect to the grid, but not for mitigating congestion problems. The CAISO should also be responsible for determining what upgrades are necessary for a reliable connection and it should stop there. It slows powerplant licensing if reliability issues are addressed during the interconnection study phase of the process and then litigated again as part of the Energy Commission's siting process.

This occurs when intervenors use the Energy Commission process to challenge study results and introduce claims. Apparently, the Energy Commission staff does not perform additional technical studies of the interconnection after the CAISO/PTO interconnection studies are completed. Mr. Phillippe thinks that 60 days to do a system study and 60 days for a DFS would be good, but sometimes the studies take longer.

He said that queuing procedures for interconnection studies and the Energy Commission siting process need clear milestones; and project developers should be required to meet those milestones or lose their place in the queue. Cost allocation is also an issue. Urban planning approaches may require developers first into an area to pay the costs of expanding the highway and off ramps to accommodate later development and be reimbursed by additional developers on a prorated basis. There is no similar provision for generation developers trying to interconnect within the same area to share reliability mitigation costs caused from their interconnection. PTO's require developers to mitigate the impacts of their own interconnecting facilities.

Regarding congestion issues, Mr. Philippe said that new and existing generators in California compete for transmission capacity and this is good as it encourages economic efficiency, but it can also keep existing generators from the market. Congestion, if unabated, can also add significant costs to electricity and to ratepayers and it can narrow supply margins and add to reliability problems.

Remedial action schemes are useful if they have limited application, but shouldn't be used as alternatives to transmission expansions. It would be better if the CAISO and PTO's develop a proactive approach toward congestion mitigation and transmission expansion. He also thinks that the CAISO and PTO's should conduct an assessment of uneconomic congestion and if it is identified, they should plan and build transmission expansions for congestion relief. He believes the market has been ineffective in stimulating these kinds of projects and that trying to have the market finance transmission projects is a "prescription for failure." It would be better to have the CAISO plan and build these projects with ratepayer financing.

Because it is important that developers know where grid congestion exists and the capability to connect generation to the grid, Mr. Philippe said that a state role could be to provide information to developers about congested areas in the state. Developers, the CAISO, and the regulatory community need to look at this question more proactively, if new generators are to locate close to load and not simply try to site generation at the cheapest, easiest location.

PUBLIC COMMENT

Mr. Pigott, Calpine

Commissioner Laurie began by asking Mr. Pigott whether he considered transmission a barrier to Calpine's generation development plans? Commissioner Laurie also asked whether, from Calpine's perspective, there is coordination work the state can do to benefit generators? Mr. Pigott said that transmission constraints can be both opportunities and barriers. It is almost always better to locate generation inside congestion zones, especially as the CAISO creates more and smaller new zones.

Locating within zones will provide more opportunities to operate and perhaps higher prices. Exporting power outside a zone will cost more. To open competition, however, it is important to have more transmission capacity to get the power to the market. As far as a state role in this area, he suggested that the state could be proactive in relieving constraints on transmission lines, although he did not provide any specific recommendations.

Mr. Shishir Mukherjee

Mr. Shishir Mukherjee discussed two issues: state ownership of the transmission grid and transmission tariffs. He stated that he believed that when California deregulated, the state should have taken over the transmission system. He does not believe the present system is working. He said that even under regulation utilities did not provide adequate transmission in some areas, citing the example of the San Francisco Bay Area. In addition, the state's transmission system was planned by the three major Investor Owned Utilities (IOUs) to serve their needs, not as a state system. It is now operated by the CAISO as a single system and this leads him to believe that deregulation has changed the way power flows on the grid. Second, Mr. Mukherjee said that the current transmission tariff is a postage stamp tariff and sets a single price for transmission service regardless of the distance power is transmitted. This leads to inefficient use of the grid.

Mr. Mark Smith, Florida Power and Light

Mr. Mark Smith said that Florida Power and Light (FPL) is currently attempting to license a project in the Rio Linda area. Mr. Smith was concerned that the Committee expressed a distrust of the market as a means to bring new generation on line. Commissioner Laurie assured him that he trusts the market to bring forth generation proposals. Commissioner Laurie said that he does not trust the market, from a long term planning perspective, to locate new generation where it should be located from the state's perspective since each generator will serve only its particular needs not the state's. Mr. Smith agreed that the generation community is a bit myopic in this regard.

Mr. John Fistoraro, NCPA.

Mr. John Fistoraro explained that the Northern California Power Agency (NCPA) was a joint powers agency of northern California municipal utilities. He said that NCPA has endorsed the concept of a not-for-profit transmission company and that the state could serve in this capacity, but that there are other alternatives. Examples would be NCPA and or the Transmission Agency of Northern California (TANC). TANC has recently proposed to upgrade Path 15 in cooperation with WAPA or the State, to reduce congestion problems between southern and northern California. Mr. Fistoraro said that congestion on Path 15 is a major concern for California and for the Western Region. In response to a question on time of completion of a Path 15 upgrade from Mr. Pernell, he stated that TANC already has environmental work underway for an upgrade and that he thought that with state cooperation a best case could be the end of 2002. Mr. Sabet said that this was optimistic as WAPA estimated three years to perform this work from the time the money was deposited. Mr. Fistoraro noted that there is broad support for the project at the federal level and by the state, but the federal government needs state commitment before it provides financial support.

Mr. Paul Scheuerman, Alpine Consulting.

Mr. Paul Scheuerman expressed concern with the use of RAS for other than "infrequent contingencies"; they are being used for situations for which they are not intended, as a low cost substitute for transmission expansions. For example, he thinks RAS is being used to curtail generation during peak load periods to prevent transmission line overloads, but this reduces the amount of generation available to meet peak load conditions. The proper solution would have been to expand the transmission system to allow generation to meet peak conditions, but this is the more costly solution. RAS may serve as a temporary fix, but at some point it is necessary to improve the transmission system. Mr. Sabet agrees that they are temporary solutions in most cases, and that over the longer term it is necessary to improve the transmission infrastructure.

ANSWERS TO THE QUESTIONS RAISED IN THE COMMITTEE'S WORKSHOP NOTICE

Issue 1: Are requirements to conduct transmission line interconnection studies delaying certification of new projects?

- 1. Interconnecting generators are responsible for the costs of mitigating reliability problems caused when they connect their facilities to the existing transmission system, including responsibility for reliability problems that are created downstream of the point of interconnection. Disputes between the connecting Participating Transmission Owner (PTO) and applicant sometimes occur over the extent and costs of reliability problems caused by the applicant generator. This occasionally has created uncertainty for developers regarding interconnection costs and can affect AFC timelines when downstream facilities may be required.*

One party said disputes between applicants and generators sometimes occurred and that there is no formal procedures for resolving such disputes, except through FERC. He suggested that the CAISO should develop a dispute resolution process to help expedite the process. No data was presented during the workshop to indicate any appreciable impacts on the interconnection process associated with these situations. No process changes are recommended; however, also see the discussion of queuing impacts below.

On a related issue, several parties urged that the costs of mitigating reliability problems should be shared among facilities connecting at the same location on the grid and contributing to the reliability problem. Current PTO policy is for each party to pay the costs of mitigating the problems it causes.

- 2. The California Independent System Operator (CAISO) and PTO interconnection process has typically required 60 days or more from the time a Detailed Facility Study (DFS) or System Impact Study (SIS) is requested until it is provided to the applicant and CAISO. In addition, the CAISO typically takes 14 to 30 days to review and approve a DFS or SIS and return it to the PTO for revision. Do the timelines for PTO interconnection studies and CAISO review of those studies create a barrier to*

timely completion of the Energy Commission process?¹ What other situations tend to delay the interconnection process? What remedies are needed to solve those problems?

As noted by Mr. Al McCuen during the workshop, to date the CAISO study review process has not impeded the Energy Commission staff's review process. Additionally, the PTO's are implementing accelerated schedules for smaller power plants where applicable. The overall transmission interconnection study process, as carried out by the PTO's and CAISO, does not tend to add time to the overall approval process, since it is carried out in parallel with other permitting and review processes.

It should be noted that on April 2 the CAISO filed a new facilities interconnection process. This new process formalizes the ISO's central role in coordinating the interconnection studies, leaving the actual study work with individual PTO. Timelines remain much the same as outlined during the workshop.

3. *Queues are utilized by each PTO and Non-Participating Transmission Owner (NPTO) to model the generation units that are assumed to be on line in order to determine reliability criteria violations in interconnection studies. Placement of a generator in the queue at the time of these studies can affect whether or not a developer's project would cause reliability violations, thus potentially increasing a facility's costs of connecting to the grid. The PTOs and NPTOs also have different methodologies for establishing queues and the queue is usually confidential information. Do these factors create uncertainty for developers concerning the costs of connecting to the grid? Do PTO, CAISO or NPTO queuing procedures create impediments to timely facility siting?*

The position in the queue can influence the costs that a developer may be required to pay, and therefore, does introduce some uncertainty into the process. However, the uncertainty introduced has more to do with the question of whether or not the developer's place in the queue is representative of his project's actual construction schedule relative to other projects. Given the confidential nature of project schedules and related data, it will be difficult to remove the uncertainty.

Since each PTO maintains its own queue, it is possible that the assumed development timeline for various projects could be different from one PTO to the next. One feature in the recent CAISO filing noted above provides for the CAISO to maintain one central queue. The maintenance of the one queue should help reduce questions and uncertainty.

4. *The siting jurisdiction of the Energy Commission and California Public Utilities Commission (CPUC) overlap for some projects where new generation would cause downstream reliability problems and new facilities would be required to mitigate reliability criteria violations. Does this create delays or other impediments to siting new generation facilities? Would a single regulatory agency, responsible for licensing both generation and transmission, mitigate such impediments (if they*

¹ The CEC CAISO Memorandum of Understanding specifies 120 days for whole process.

exist)? Would having a single regulatory authority, responsible for licensing both generation and transmission, make it easier to determine whether new generation or new transmission is preferable to meet local needs

To date no information has been offered to suggest that joint siting authority between the Energy Commission and CPUC causes delays or other impediments to the siting process.

Currently the CAISO determines the extent, if any, to which a non-wires project will be perused as an alternative to a transmission project. They carry this process out as part of their overall market development and reliability process. It would seem that the preferred means of meeting load should continue to reside with the ISO, if for no other reason than, for reliability purposes. Since the CAISO does not have “regulatory” or “licensing” authority there remains a need for a second agency to exercise the regulatory and licensing provisions of the law. Additionally, since the CPUC bears the responsibility for setting rates for retail transmission, it seems appropriate that they have input into the approval of new transmission facilities through the CPCN process.

Issue 2: What siting constraints are the result of transmission congestion and access to markets? How should those constraints be resolved?

- 1. Does transmission congestion in some locations limit the ability of power plant developers to access electricity markets, and does this affect their siting decisions? What factors are most responsible for influencing such decisions?*

Congestion does influence siting decisions by new generators. The CAISO prefers to have generation locate close to load centers and uses transmission congestion to signal its preferences in siting locations. Locating close to load reduces congestion costs and losses for generators, but it may raise air quality, water, land use, and public opposition issues, that also have costs associated with their resolution. Locating remote from load increases the costs of congestion and losses. It may also require expensive transmission additions to obtain market access. Locating new power plants is a balancing act of whether to locate close to load and address environmental and land use issues or locate in more remote areas and solve congestion and grid expansion problems.

If transmission capacity is available, congestion and grid expansion costs may not be significant barriers to locating generation remote from load centers. However, the availability of transmission to remote areas may be a problem. Transmission planners said they are often uncertain where generators will locate and it is difficult for them to plan transmission to serve new facilities under conditions of uncertainty. The CAISO also has transmission planning issues, as it has not been proactive in planning and developing economic transmission projects. The CAISO does plan a more proactive role for itself in the development of economic transmission projects.

SMUD proposed energy parks as potential sites to locate generation. Energy parks are relatively large land tracts capable of accommodating significant generation capacity. They would be suitable from environmental and land use perspectives and would have transmission, gas, and water facilities available. Rancho Seco is a

potential park site. They could also provide transmission planners with a much higher level of certainty for planning transmission facilities to service new generators.

2. *Does increasing congestion caused by new generators connecting to the grid limit the ability of “in place” generation to compete with newer power plants for transmission access? Does this adversely affect the ability of existing generation to get their power to market? If transmission access for older generation is limited by this circumstance, would this eventually affect the amount of net generation available under some conditions?*

Only one panelist commented on this issue. Mr. Philippe said that new and existing generation competes for transmission access in congested areas and it can keep existing generators from the market. Unabated congestion can add significantly to the costs of electricity for rate payers and can narrow supply margins. He suggests a more active role for the CAISO in planning transmission to relieve congestion problems.

3. *Congestion problems can result when transmission lines become overloaded under heavy use and system dispatchers must dispatch around constraints or take other remedial actions to avoid reliability problems and still serve load. Should these “remedial action schemes” be viewed as short-term or long-term solutions to congestion?*

Panelists believe there is a trend toward increased use of remedial actions schemes (RAS) to address reliability problems, because they are relatively inexpensive fixes for solving certain reliability problems. It was also mentioned that RAS may provide benefits under some circumstances (Calpine's Sutter generation project is an example). All panelists expressed concern with the widespread use of RAS over the long-term as a substitute for transmission expansions. The use of RAS causes several problems. It does not add transmission capacity to the system, and thus, does not reduce system congestion or provide increased market access. Coordination problems among control areas are also a concern. Finally, if RAS is used only under certain extreme conditions, e.g., peak load emergency conditions, it may reduce generation output from a facility when it is most needed by the system under peak load conditions.

4. *The CAISO does not require new generators to mitigate congestion problems they cause when they connect to the grid, as it does reliability problems; rather, it assumes that such problems will be solved through market forces. This approach has not worked as anticipated. In addition, the CAISO's grid planning process focuses on resolving reliability problems, not congestion problems. The result seems to be a flaw in the CAISO's grid planning procedures. What alternatives to the present approach to planning and financing transmission expansions to address congestion issues would be most effective in resolving this problem? For example would state involvement and funding, CAISO and PTO planning and financing, or redesigned market mechanisms be more effective?*

Panelists offered various levels of support for the three options proposed in the OII Notice. We also briefly summarize a land use model for transmission expansion suggested by Commissioner Laurie.

Market Option. Virtually no one suggested that a market approach for resolving congestion problems should be further explored. It was argued that it is difficult to encourage investment in market based projects because there are insufficient incentives and potential benefits are too widely dispersed among different parties. This discourages cooperative efforts to jointly finance such projects. The more general problem is that no single entity or group of entities that participates in the CAISO planning process, is responsible for planning, financing and building economic transmission projects.

CAISO/PTO option. Most parties did support a more proactive role for the CAISO and PTOs in planning and developing transmission facilities to relieve congestion and provide market access. Mr. Miller said that the CAISO is proposing a more proactive role for itself in this area in its long-term grid planning process. PG&E and WAPA representatives also expressed support for a more proactive role for the CAISO in this area.

A State Role. There was support for an enhanced state role in the transmission planning area. One party suggested a role for the state in identifying transmission constrained areas and providing that information to developers to expedite the interconnection study process. It was also suggested that the state investigate potential transmission rights of way to secure long-term transmission planning opportunities. Several parties recommended state ownership of the CAISO-controlled transmission system.

A Land Use Model. Commissioner Laurie suggested a model for grid expansion based on a land use planning approach. The model requires developers and builders to pay for highway expansions and off ramps to reduce road congestion caused by their developments. By analogy, generation developers would be required to mitigate incremental congestion caused by their facilities and to allocate pro-rata costs to future developers. There is currently no provision for this in the interconnection process as the PTOs require each developer to mitigate its own reliability problems. The model may not be applicable because FERC has rejected the concept that developers should pay to relieve incremental congestion (as opposed to reliability problems) they cause as a result of interconnection.

STAFF RECOMMENDATIONS BASED ON WORKSHOP DISCUSSIONS

- The Energy Commission should support efforts by the CAISO and PTOs to plan, finance and develop economic transmission projects to reduce congestion and provide market access.
- The Energy Commission should direct the staff to obtain information concerning trends in the use of RAS on the state's transmission system, the consequences of

a proliferation of RAS, and the consequences on facility siting in the state if the use of RAS is limited as a tool for mitigating reliability problems.

- The Energy Commission should direct the staff, in coordination with the CAISO and PTOs, to explore potential locations for, and the costs and benefits of, energy parks as siting locations for new generation facilities.
- The Energy Commission should direct the staff to examine whether it is feasible for the Energy Commission to undertake a role in identifying potential transmission rights of way, in order to secure future corridors for long term grid planning.
- The Energy Commission should direct the staff to examine the feasibility of an Energy Commission role in developing information on transmission congested locations in the state and use this information to inform siting applicants of advantageous siting locations.
- The Energy Commission should recommend to the CAISO and PTOs to jointly explore the feasibility and benefits of generators connecting at a common location on the grid, to share the costs of mitigating reliability problems caused by their interconnections.

